

Chapter 5: TESTING

5.1 Test Plan

INTRODUCTION

A test plan has multiple benefits like we can have idea about software defects, quality assurance, working performance, and software development strategy. Making test plan gives following benefits:

- Test Plan helps us determine the effort needed to validate the quality of the application under test
- Help people outside the test team such as developers, business managers, customers understand the details of testing.
- Test Plan guides our thinking. It is like a rule book, which needs to be followed.
- Important aspects like test estimation, test scope, Test strategy are documented in Test Plan, so it can be reviewed by Management Team and re-used for other projects.

Product Analysis

Grampanchyat Sultanwadi is a official app for android mobile devices. In which Grampanchyat Sultanwadi is a local office related work in Grampanchyat. This app provides digital platform for the business and its existing people. The people in the village are the member are the active members of the Grampanchyat who goes to Grampanchyat on week basis and the normal user customers/members can use this app. This app is mainly designed and developed for pure android platform mobile device users who have access to android phone and internet connectivity.

This app is built on android studio the android development framework which uses android, firebase, xml and java technology. The app uses Google android library and Gradle files for working on android device. The technology Firebase makes the app real time. The use of real time Firebase database makes app accessible from anywhere from the globe. This software required android device with internet connectivity. To run **Grampanchyat Sultanwadi** app a user must have an android phone and the internet connectivity. The android platform must be above Android 5.1

- 1 The project's testing objectives and the means to achieve them
- 2 Determines testing effort and costs

SCOPE

This app is going to use by thousands of active member of Grampanchyat. The working environment for the Grampanchyat members is on network. Therefore there are lots of digital challenges for the application in field of user information and data security, vulnerability, user security.

There testing of software is very important in this scenario. For testing the application there are the following strategies to follow;

Precise customer requirement:

- 1 User creation
- 2 User Login
- 3 Notifications of various work in village.
- 4 Digital tax payment

Product Specification:

The Grampanchyat app is an android app. Provide features like various Notifications of village, local news , digital tax payment, put various complaints on it, User registration, login and Settings etc.

Testing Skills for Tester:

The tester must have knowledge how to use android phone and internet. The tester must have basic knowledge about Black Box testing methodology.

- 1 Knowledge of Android Phone Operating
- 2 Black Box Testing Methodologies
- 3 Functional Testing

In Scope

- As the software requirement specification the project Grampanchyat Sultanwadi only focus on testing all the functions and external interface of application Grampanchyat Sultanwadi in scope testing.
- Functional testing

Out of Scope

- Nonfunctional testing such as stress, performance or logical database currently will not be tested in out of scope.
- Database testing

TESTING TYPE

Definition:

A Testing Type is a standard test procedure that gives an expected test outcome. Each testing type is formulated to identify a specific type of product bugs. But, all Testing Types are aimed at achieving one common goal “Early detection of all the defects before releasing the product to the customer” In the testing of the app the testing methodology used are follows;

Unit Testing:

Unit testing is a software development process in which the smallest testable parts of an application, called units, are individually and independently scrutinized for proper operation. Unit testing can be done manually but is often automated.

DOCUMENT AND RISK ISSUES

Description:

Risk is future's uncertain event with a probability of occurrence and a potential for loss. When the risk actually happens, it becomes the 'issue'. In the article risk analysis and solution, you have already learned about the 'Risk' analysis in detail and identified potential risks in the project.

In the Test Plan, you will document those risks

Module Name	Applicable Roles	Description
New User	Admin	Admin: A Admin can create a new account with the help of Email and Password
Login	User	User: A user can login after successful Email verification with Email and Password
Forgot Password	User	User: A user can reset password using registered Email
First Login	User	User: A user can all the information about it or modify it
Change Password	User	User: A user can change password
Edit Profile	User	User: A user can edit his profile details
Logout	User	User: A user can logout from his account
Login	Admin	Admin: A admin can login by using Email and password
Logout	Admin	Admin: A admin can logout from his account.
Push Notification	Admin	Admin: A admin can put the Notification to user.

Table 5.1.1 Document and Risk Analysis

RISK

- 1 Team member lack the required skills for application testing
- 2 The project schedule is too tight; it's hard to complete this project on time
- 3 Test Manager has poor management skill
- 4 A lack of cooperation negatively affects your employees' productivity
- 5 Wrong budget estimate and cost overruns

Test Logistics

Who will test?

You may not know exact names of the tester who will test, but the type of test can be defined. To select the right member for specified task, you have to consider if his skill is qualified for the task or not, also estimate the project budget. Selecting wrong member for the task may cause the project to fail or delay. Person having the following skills is most ideal for performing software testing:

- Ability to understand customers point of view
- Strong desire for quality
- Attention to detail
- Good cooperation

When test will occur?

Test activities must be matched with associated development activities. You will start to test when you have all required items shown in following

- 1 When test specification and requirement document is ready
- 2 When Human resources are available
- 3 When test environment is ready

TEST OBJECTIVE

Definition:

Test Objective is the overall goal and achievement of the test execution. The objective of the testing is finding as many software defects as possible; ensure that the software under test is **bug free** before release. To define the test objectives, you should do following steps

- 1 List all the software features functionality, performance, GUI which may need to test.
- 2 Define the **target** or the **goal** of the test based on above features

Based on above features, you can define the Test Objective of the project Grampanchyat Sultanwadi as following

- Check that whether application Grampanchyat Sultanwadi functionality Login, registration, Notification, Tax payment are working as expected without any error or bugs in real business environment
- Check that the external interface of the application such as **UI** is working as expected and & meet the customer need
- Verify the usability of the application.

TEST CRITERIA

Suspension Criteria

If team members report that there are **40%** of test cases failed, should suspend testing until the development team fixes all the failed cases. Specify the critical suspension criteria for a test. If the suspension criteria are met during testing, the active test cycle will be suspended until the criteria are resolved.

Exit Criteria

Team has already done the test executions. They report the test result, and they want to confirm the Exit Criteria. In above case, the Run rate is mandatory is 100%, but the test team only completed 90% of test cases. It means the Run rate is not satisfied, so do NOT confirm the Exit Criteria. It specifies the criteria that denote a successful completion of a test phase. The exit criteria are the targeted results of the test and are necessary before proceeding to the next phase of development. Example: 95% of all critical test cases must pass. Some methods of defining exit criteria are by specifying a targeted run rate and pass rate.

- Run rate is ratio between number test cases executed/total test cases of test specification. For example, the test specification has total 120 TCs, but the tester only executed 100 TCs, So the run rate is $100/120 = 0.83$ (83%)
- Pass rate is ratio between numbers test cases passed / test cases executed. For example, in above 100 TCs executed, there're 80 TCs that passed, so the pass rate is $80/100 = 0.8$ (80%)

This data can be retrieved in Test Metric documents.

- Run rate is mandatory to be 100% unless a clear reason is given.
- Pass rate is dependent on project scope, but achieving high pass rate is a goal.

RESOURCE PLANNING

Resource plan is a detailed summary of all types of resources required to complete project task. Resource could be human, equipment and materials needed to complete a project

This section represents the recommended resources for project.

- 1 Test Manager
- 2 Tester
- 3 Developer in Test
- 4 Test Administrator
- 5 SQA members
- 6 Network
- 7 Computer

Test Plan Environment

Definition:

A testing environment is a setup of software and hardware on which the testing team is going to execute test cases. The test environment consists of real business and user environment, as well as physical environments, such as server, front end running environment.

- What is the maximum user connection which this application can handle at the same time?
- What are hardware/software requirements to install this application?
- Does the user's computer need any particular setting to browse the application?

SCHEDULE AND ESTIMATION

In the Test Estimation phase, break out the whole project into small tasks and add the estimation for each task as below

TASK	MEMBERS	ESTIMATE EFFORT
Create the test specification	Test Designer	170 man-hour
Perform Test Execution	Tester, Test Administrator	80 man-hour
Test Report	Tester	10 man-hour
Test Delivery		20 man-hour
Total		280 man-hour

Table 5.1.2 Scheduled and Estimation

Test Deliverables

Test deliverables are provided before testing phase.

- Test plans document.
- Test cases documents

Test deliverables are provided during the testing

- Test Scripts
- Simulators.
- Test Data.

Test deliverables are provided **after** the testing cycles is over.

- **Test** Results/reports
- Defect Report
- Installation/ Test procedures guidelines